ACCESSION #: 9907010234

NON-PUBLIC?: N

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Millstone Nuclear Power Station Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000336

TITLE: Manual Reactor Due to Steam Leak in Turbine Building

EVENT DATE: 05/25/99 LER #: 99-009-00 REPORT DATE: 06/23/99

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: M. D. Ehredt, TELEPHONE: (860) 440-2142

MP2 Acting Regulatory Compliance Supervisor

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On May 25, 1999, (Mode 1, 100% power) at 1512, a manual reactor trip was initiated due to a report of a steam leak in the turbine building. The steam leak occurred following erratic feedwater heater level response. The steam leak was located at the inlet flange to the shell side relief valve for the 1A feedwater heater. All safety related equipment performed as expected and the plant was stabilized at normal post trip parameters. Additionally, the Main Steam Isolation Valves were shut to isolate steam to the turbine building.

The event was caused by inadequate controls associated with the adjustment and grooming of the feedwater heater level control valves which resulted in an overpressure condition when the shell side relief valve lifted. The resultant force caused a steam leak at the relief valve flange. Inadequate gasket compression was caused by improper torquing of the feedwater heater 1A shell side relief valve flange studs which resulted from unclear guidance in the procedure used for determining the torque values.

Corrective actions pertaining to this event include refining of controls for adjusting feedwater heater string controls and clarifying guidance concerning torqued connections when significant dynamic piping loads are expected from events such as water hammer's or the opening of pressure relief devices.

TEXT PAGE 2 OF 4

I. Description of Event

On May 25, 1999, (Mode 1, 100% power) at 1512, a manual reactor trip [RCT] was initiated due to a report of a steam leak in the turbine [TRB] building. The steam leak occurred following erratic feedwater heater [HX] level response. The steam leak was located at the inlet flange to the shell side relief valve [RV] for the 1A feedwater heater. All safety related equipment performed as expected and the plant was stabilized at normal post trip parameters. All procedurally required activities were accomplished. Additionally, the Main Steam [SB] Isolation Valves [ISV] (MSIV) were shut to isolate steam to the turbine building.

Prior to the manual reactor trip, at approximately 1419, control board operators had received numerous Feedwater Heater 2A Low Level alarms. Control board operators reduced power and began borating and using control rods [ROD] to stabilize the plant. Operator's and Instrument

and Control personnel were dispatched to evaluate conditions local to the feedwater heater. Prior to any adjustment, a 2A high level alarm was received.

At the feedwater heaters the following conditions were noted. The levels in the 1A and 2A feedwater heaters were very high. The 2A high level control valve was observed to be closed. Based on the level in the 2A feedwater heater, the valve should have been full open.

The 1A high level control valve was observed to be about 50% open. This high level control valve should have been full open based on heater level. Shortly after initial observations were made the 1A shell side relief valve began lifting. The relieving action initiated a substantial movement of piping in the overhead of the turbine building. As a result of the movement, a steam leak developed on the inlet flange to the 1A shell side relief valve. It was this steam leak that was reported to the control room. Based on this report, the Shift Manager directed that the reactor be tripped manually.

Following the reactor trip and MSIV closure, the plant was stabilized at Tave 532 degrees F using the atmospheric steam dump.

The reactor was manually tripped due to a significant steam leak in the turbine building. The steam leak occurred at the inlet flange to the feedwater heater 1A shell side relief valve. The initial leakage was reported to be slight (puffs) quickly increasing to substantial leakage.

This event is being reported pursuant to the requirements of 10CFR50.73(a)(2)(iv), any event or condition that results in a manual or automatic actuation of any engineered safety feature, including the reactor protection system.

II. Cause of Event

The event was caused by inadequate controls associated with the adjustment and grooming of the feedwater heater level control valves which resulted in an overpressure condition when the shell side relief valve lifted. The resultant force caused a steam leak at the relief valve flange. Inadequate gasket compression was caused by improper torquing of the feedwater heater 1 A shell side relief valve flange studs which resulted from unclear guidance in the procedure used for determining the torque values.

III. Analysis of Event

At approximately 1419 on May 24, 1999, the control room operators received numerous Feedwater Heater 2A Low Level alarms followed by a 2A high level alarm. The 2A Feedwater Heater is the last heater in the "A" Feedwater Heater Train prior to the suction of the Feedwater Pumps. The shell side of the 2A Feedwater Heater receives input from the 1A Feedwater Heater, High Pressure Turbine extraction steam, and drains from the Moisture Separator Drain Tank. Two equipment operators were dispatched to evaluate conditions local to the feedwater heater. At the feedwater heaters it was noted that the 1 A

Feedwater Heater level was very high. (One

report had it out of sight high.) The 2A Feedwater Heater level was out of sight high. At this point, the 2A Feedwater Heater high level control valve was observed to be closed; based on level it should have been full open. The 1A Feedwater Heater normal level control valve was closed. This is the expected position based on the high level in the 2A Feedwater Heater. The 1A Feedwater Heater high level control valve was observed to be about 50% open. This high level control valve should have been full open based on heater level.

The increasing water level in the shell side of the 1A and 2A Feedwater Heater's resulted in a feedwater temperature decrease. The feedwater temperature decrease subsequently reduced Reactor Coolant System temperature resulting in increasing reactor power. The control room operators inserted control rods and borated to maintain reactor power, matched turbine load with reactor power, and stabilized the plant.

The 1A Feedwater Heater receives extraction steam [SE] from the High Pressure Turbine and drain flow from both the first stage and second stage Moisture Separator Reheater Drain Tanks [SN]. If level in the 1A Feedwater Heater reaches the high level setpoint, the extraction steam to the 1A Feedwater Heater isolates. The drain valves for the first and second Stage Moisture Separator Reheater Drain Tanks, at

pressures of 450 psig and 870 psig respectively, do not, however, isolate on a high level in the 1A Feedwater Heater. Shortly after initial observations were made, the 1A Feedwater Heater shell side relief, set at approximately 450 psig, began lifting. The relieving action initiated a substantial movement of piping in the overhead of the turbine building. As a result of the movement, a steam leak developed on the inlet flange to the 1A Feedwater Heater shell side relief valve. It was this steam leak that was reported to the control room. For reasons of personnel safety and equipment protection, the Shift Manager ordered a reactor trip and a closure of the MSIVs. The reactor was manually tripped due to a secondary system steam leak within the turbine building. There were no safety consequences as a result of this event. All equipment responded as expected and no safety systems were compromised by this secondary system event. Therefore, this event is not safety significant.

IV. Corrective Action

As a result of this event, the following actions have been, or will be, performed.

1. Appropriate controls for grooming feedwater heaters will be developed by September 30, 1999, including the adjustment of level set and range of acceptable level set values versus the proportional band.

2. The appropriate torquing procedure will be revised by September

30, 1999, to incorporate changes to clarify the use of the procedure when significant dynamic piping loads are expected from events such as water hammers or the opening of pressure relief devices.

V. Additional Information

Similar Events

LER 91-012: Manual Reactor Trip Due to Plant Conditions Resulting From a Rupture in the Reheater Drain Tank to High Pressure Feedwater Heater Pipe

LER 95-032: Manual Reactor Trip Due to Unisolable Secondary Steam Leakage Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

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Figure "Heater Drains" omitted.

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